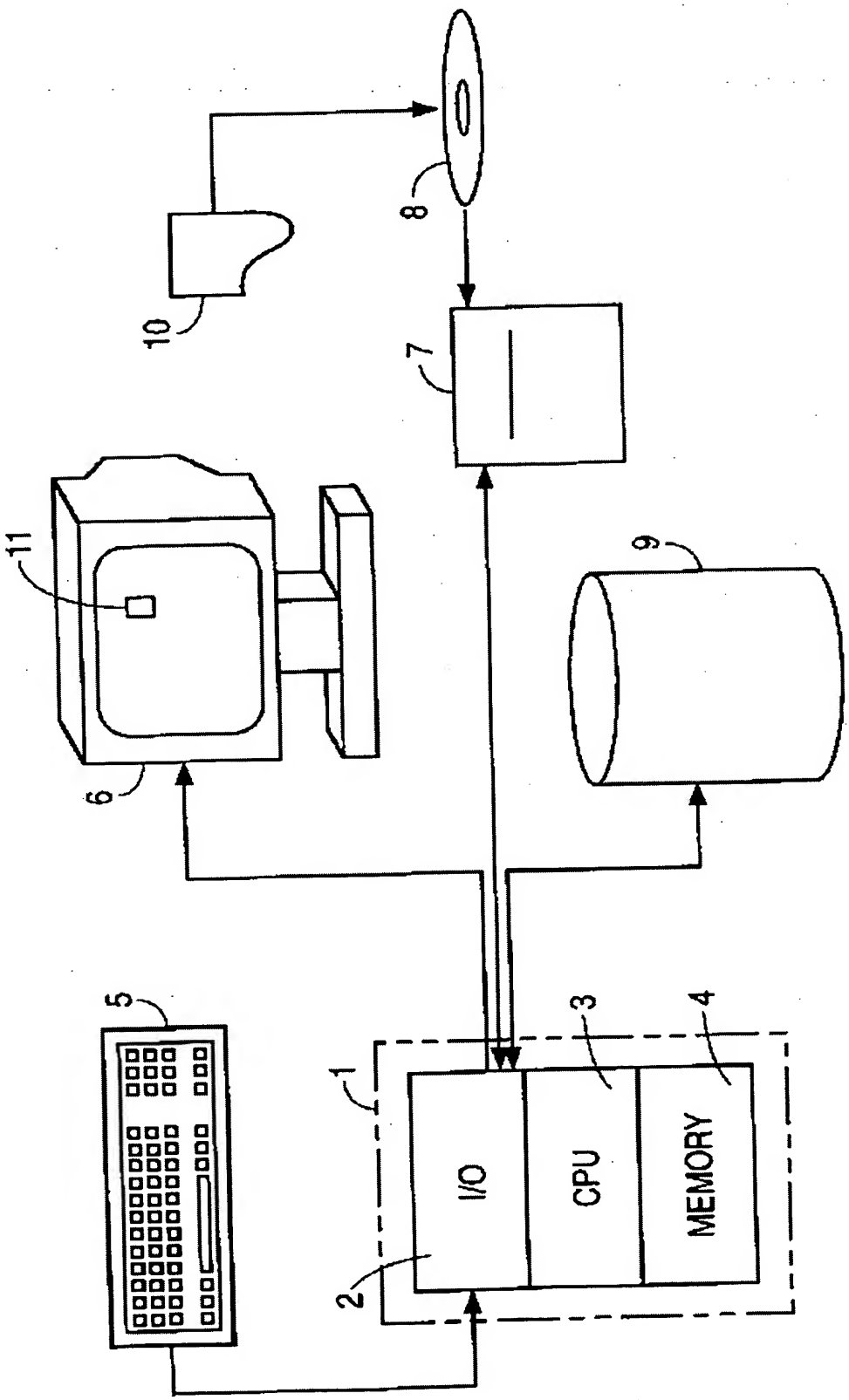

FIG. 1

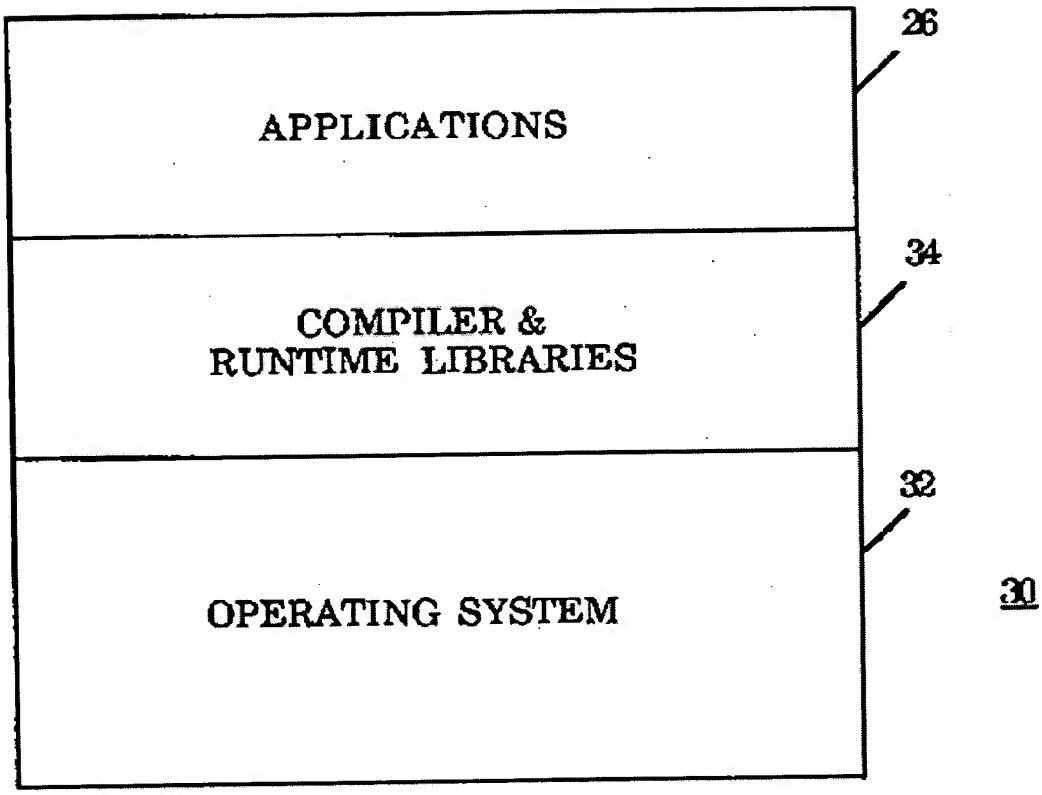
APPLICATIONS
26
COMPILER &
RUNTIME LIBRARIES
34
OPERATING SYSTEM
32
30

FIG. 2

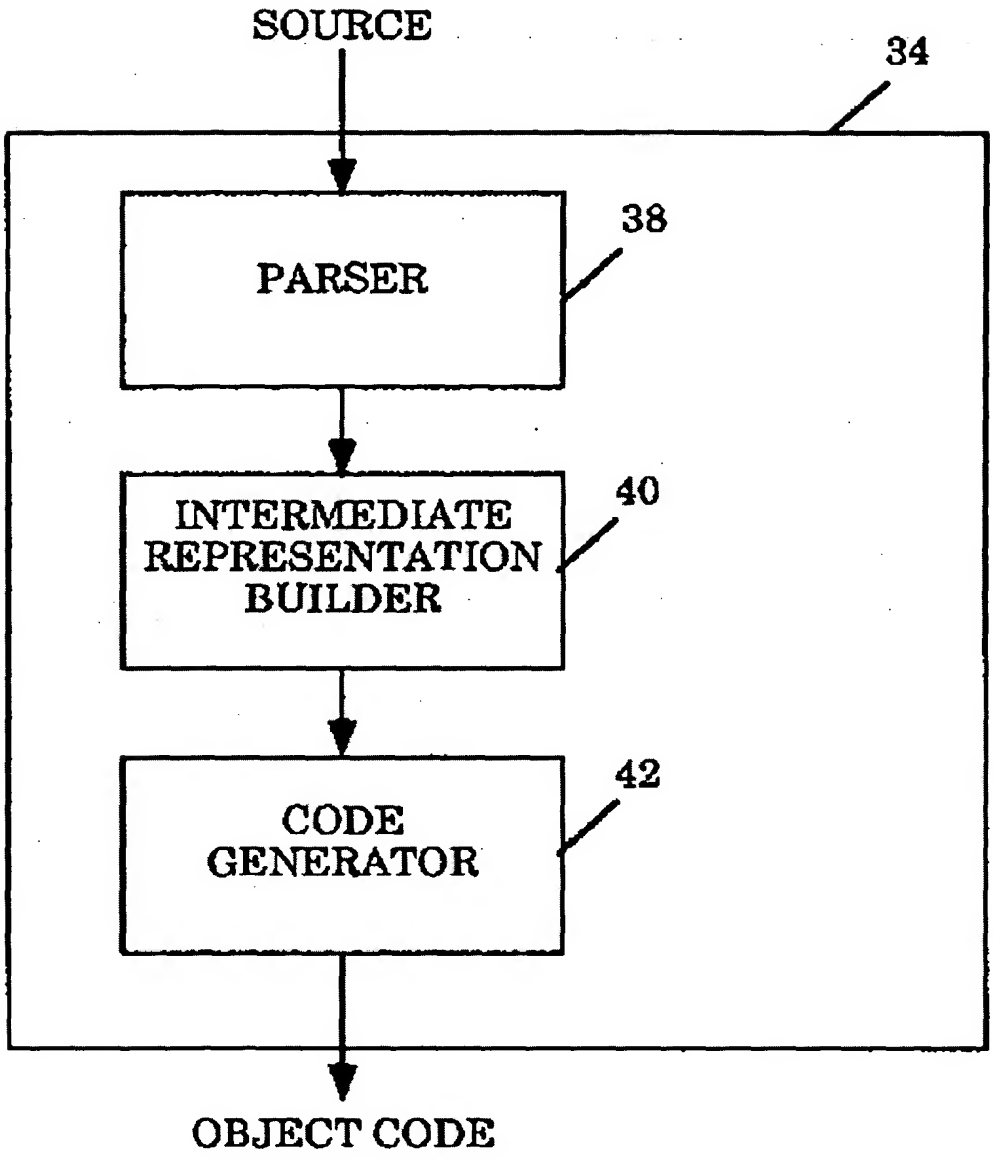
SOURCE
34
PARSER
38
INTERMEDIATE REPRESENTATION BUILDER
40
CODE GENERATOR
42
OBJECT CODE

FIG. 3a

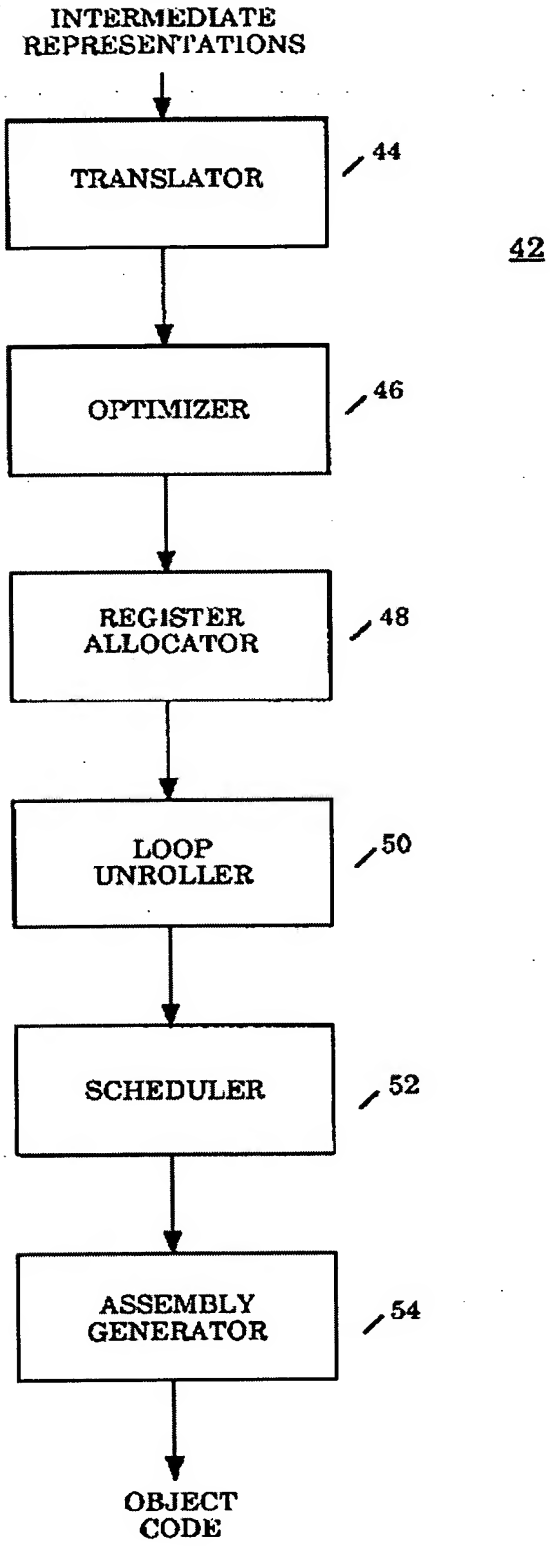
INTERMEDIATE REPRESENTATIONS
TRANSLATOR
44
42
OPTIMIZER
46
REGISTER ALLOCATOR
48
LOOP UNROLLER
50
SCHEDULER
52
ASSEMBLY GENERATOR
54
OBJECT CODE

FIG. 3b

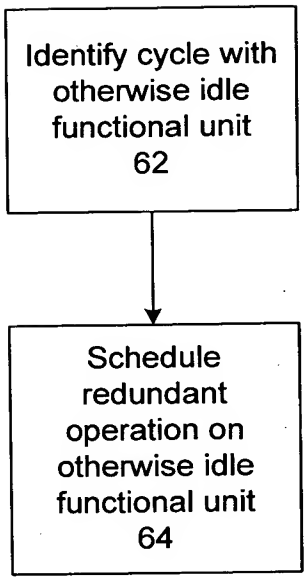
Identify cycle with otherwise idle functional unit
62
Schedule redundant operation on otherwise idle functional unit
64
60

FIG. 4a

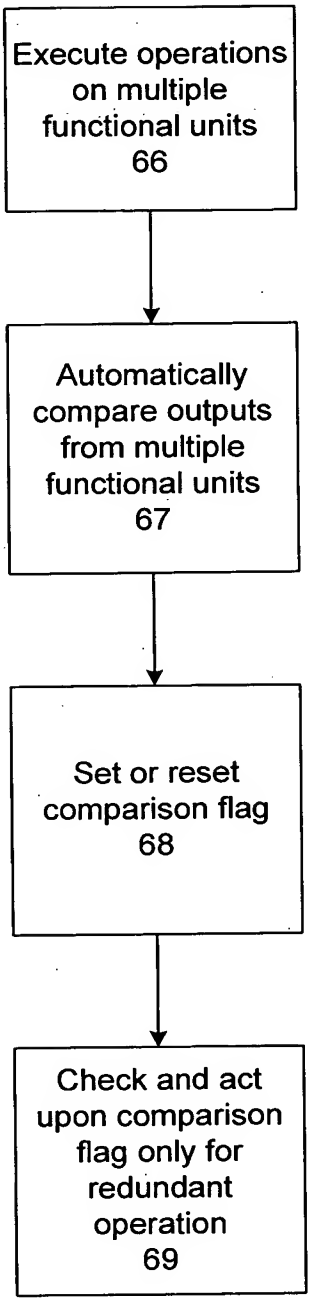
Execute operations on multiple functional units
66
Automatically compare outputs from multiple functional units
67
Set or reset comparison flag
68
Check and act upon comparison flag only for redundant operation
69
65

FIG. 4b

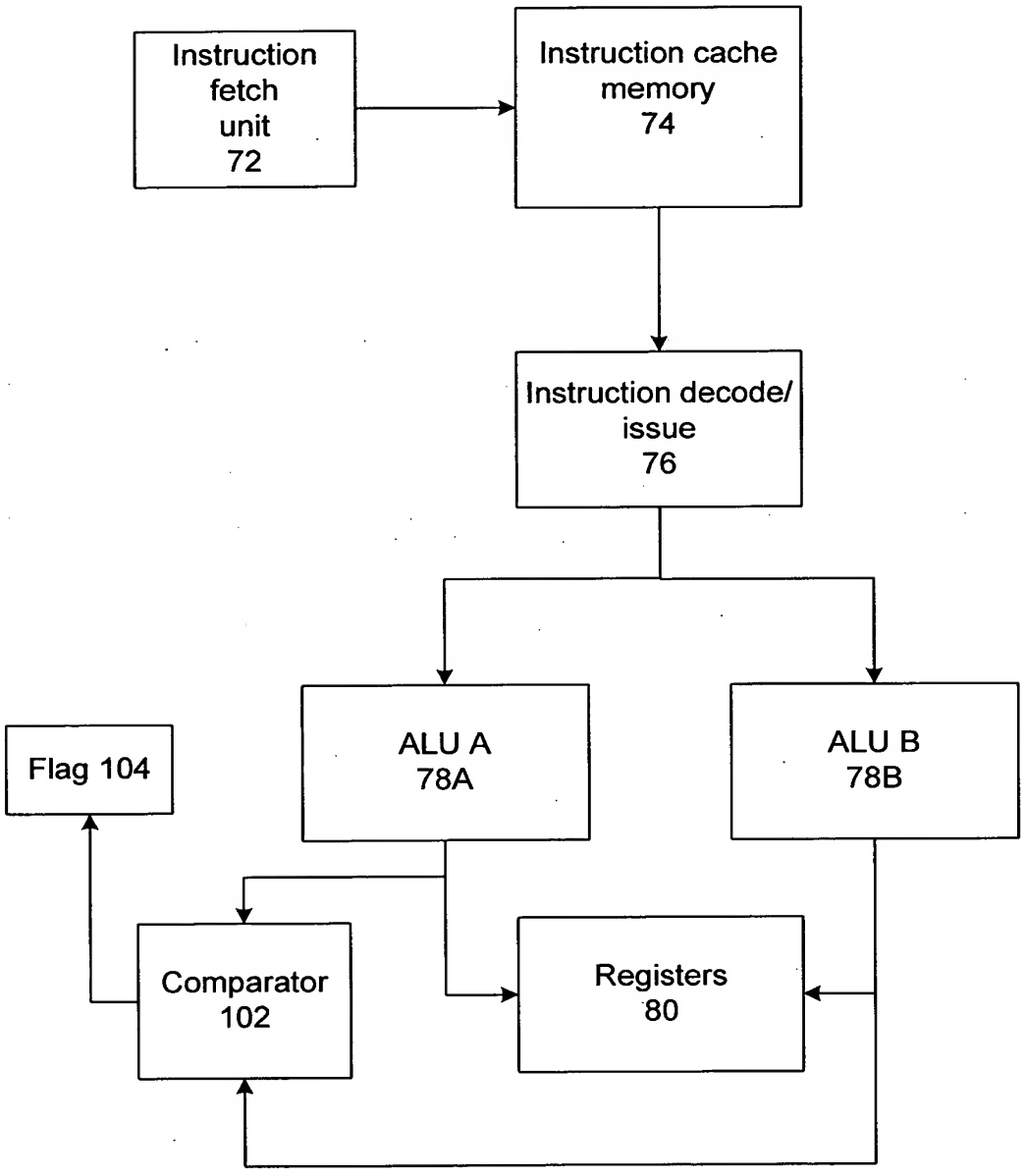
Instruction fetch unit 72
Instruction cache memory 74
Instruction decode/ issue 76
ALU A 78A
ALU B 78B
Flag 104
Comparator 102
Registers 80

FIG. 5

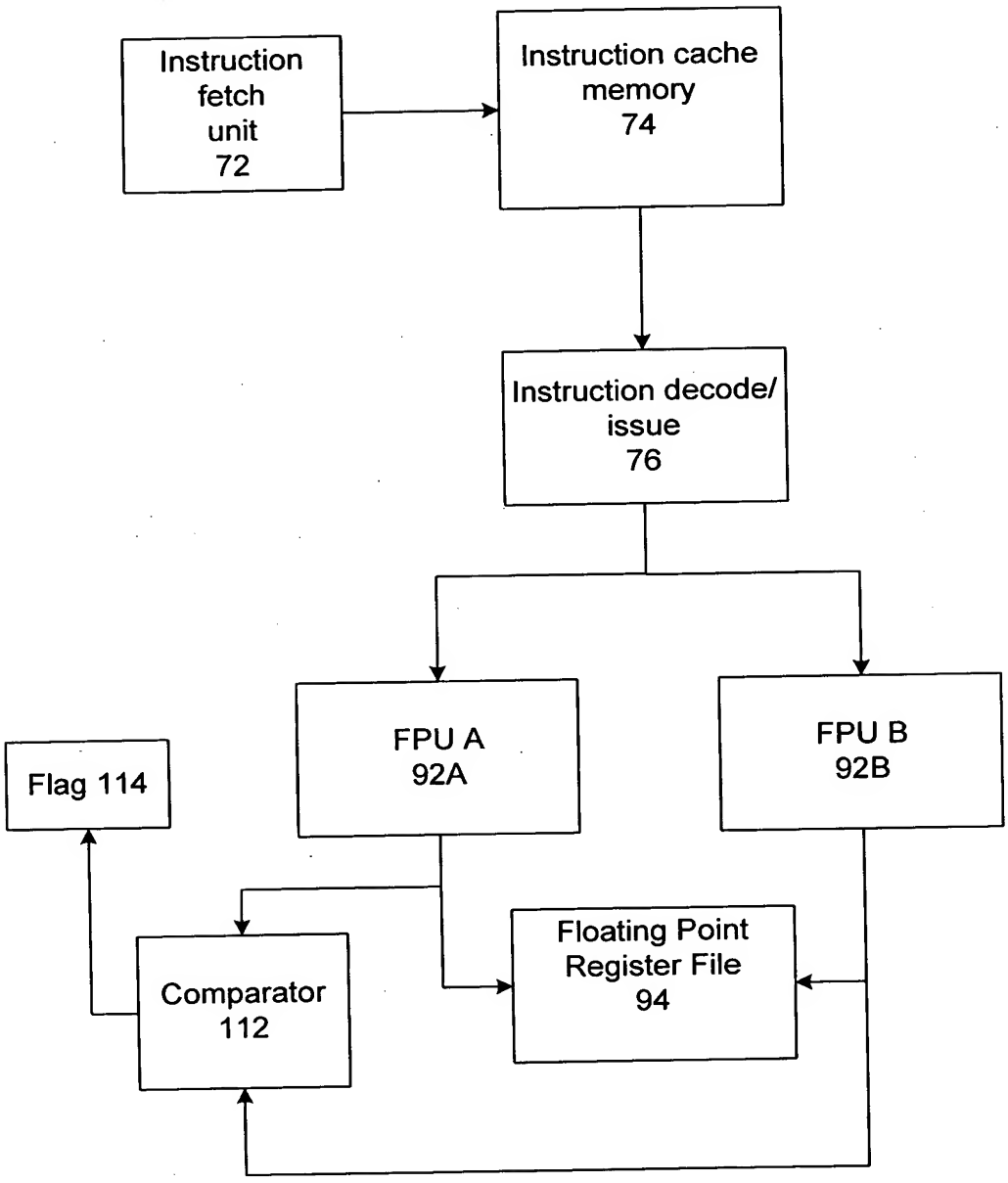
Instruction fetch unit 72
Instruction cache memory 74
Instruction decode/ issue 76
FPU A 92A
FPU B 92B
Flag 114
Comparator 112
Floating Point Register File 94

FIG. 6